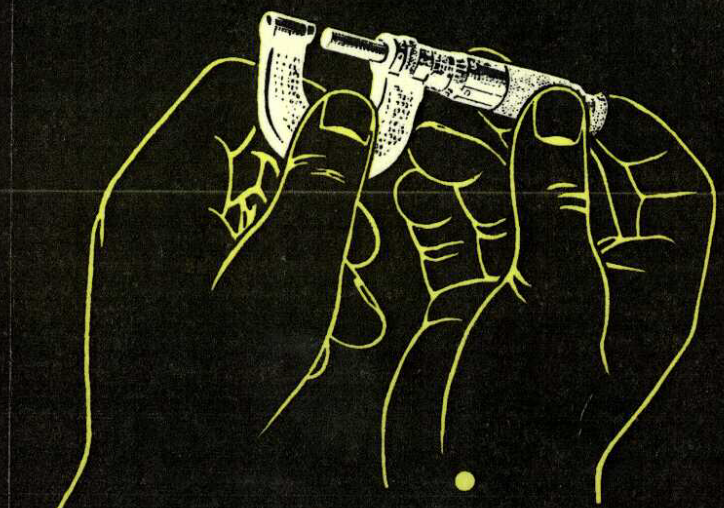
ZEUS PRECISION



DATA CHARTS AND REFERENCE TABLES FOR DRAWING OFFICE TOOLROOM & WORKSHOP

65p

METRIC REVISION 1976

CONVERSION FACTORS

LENGTH

1 cm	= 0·3937 in	1 in	= 25·4 mm
1 m	= 3·2808 ft	1 ft	= 0·3048 m
1 km	= 0·6214 mile	1 mile	= 1·6093 km

WEIGHT

1 g	= 0·0353 oz	1 oz	= 28·35 g
1 kg	= 2·2046 lb	1 lb	= 0·4536 kg
1 tonne	= 0·9842 ton	1 ton	= 1·016 tonne

AREA

1 m^2	= 1·196 $yard^2$	1 in^2	= 645·2 mm^2
1 hectare	= 2·471 acre	1 $yard^2$	= 0·8361 m^2
		1 acre	= 0·4047 hectare
		1 sq mile	= 259 hectare

CAPACITY

1 cm^3	= 0·061 in^3	1 in^3	= 16·387 cm^3
1 m^3	= 1·308 $yard^3$	1 $yard^3$	= 0·7646 m^3
1 litre	= 1·761 pints	1 pint	= 0·57 litre
1 litre	= 0·22 gallons	1 gallon	= 4·5461 litre

VELOCITY

1 km/h	= 0·6215 mile/h	1 mile/h	= 1·609 km/h
1 m/s	= 3·2808 ft/s	1 ft/s	= 0·3048 m/s

Light 182,282 mile/s = 299·79 M m/s

$\pi \simeq 3{\cdot}14159$

Printed by Seel House Press Liverpool
on behalf of the Proprietors:

TECHNICAL INFORMATION COMPANY
P.O. BOX 59, JERSEY
BRITISH CHANNEL ISLANDS

STANDARD DRILL SIZES AND DECIMAL EQUIVALENTS

STANDARD SIZES		
in.	m.m.	Dec.
	0.20	0.0079
	0.22	0.0087
	0.25	0.0099
	0.28	0.0110
	0.30	0.0118
	0.32	0.0126
	0.35	0.0138
	0.38	0.0150
1/64		0.0156
	0.40	0.0157
	0.42	0.0165
	0.45	0.0177
	0.48	0.0189
	0.50	0.0197
	0.52	0.0205
	0.55	0.0217
	0.58	0.0228
	0.60	0.0236
	0.62	0.0244
	0.65	0.0256
	0.68	0.0268
	0.70	0.0276
	0.72	0.0283
	0.75	0.0295
	0.78	0.0307
1/32		0.0312
	0.80	0.0315
	0.82	0.0323
	0.85	0.0335
	0.88	0.0346
	0.90	0.0354
	0.92	0.0362
	0.95	0.0374
	0.98	0.0386
	1.00	0.0394
	1.05	0.0413
	1.10	0.0433
	1.15	0.0453
3/64		0.0469
	1.20	0.0472
	1.25	0.0492
	1.30	0.0512
	1.35	0.0532
	1.40	0.0551
	1.45	0.0571
	1.50	0.0591
	1.55	0.0610
1/16		0.0625
	1.60	0.0630
	1.65	0.0650

STANDARD SIZES		
in.	m.m.	Dec.
	1.70	0.0669
	1.75	0.0689
	1.80	0.0709
	1.85	0.0728
	1.90	0.0748
	1.95	0.0768
5/64		0.0781
	2.00	0.0787
	2.05	0.0807
	2.10	0.0827
	2.15	0.0846
	2.20	0.0866
	2.25	0.0886
	2.30	0.0906
	2.35	0.0925
3/32		0.0938
	2.40	0.0945
	2.45	0.0965
	2.50	0.0984
	2.55	0.1004
	2.60	0.1024
	2.65	0.1043
	2.70	0.1063
	2.75	0.1083
7/64		0.1094
	2.80	0.1102
	2.85	0.1122
	2.90	0.1142
	2.95	0.1161
	3.00	0.1181
	3.10	0.1220
1/8		0.1250
	3.20	0.1260
	3.30	0.1299
	3.40	0.1339
	3.50	0.1378
9/64		0.1406
	3.60	0.1417
	3.70	0.1457
	3.80	0.1496
	3.90	0.1535
5/32		0.1562
	4.00	0.1575
	4.10	0.1614
	4.20	0.1654
	4.30	0.1693
11/64		0.1719
	4.40	0.1732
	4.50	0.1772
	4.60	0.1811

STANDARD SIZES		
in.	m.m.	Dec.
	4.70	0.1850
3/16		0,1875
	4.80	0.1890
	4.90	0.1929
	5.00	0.1968
	5.10	0.2008
13/64		0.2031
	5.20	0.2047
	5.30	0.2087
	5.40	0.2126
	5.50	0.2165
7/32		0.2188
	5.60	0.2205
	5.70	0.2244
	5.80	0.2283
	5.90	0.2323
15/64		0.2344
	6.00	0.2362
	6.10	0.2402
	6.20	0.2441
	6.30	0.2480
1/4		0.2500
	6.40	0.2520
	6.50	0.2559
	6.60	0.2598
	6.70	0.2638
17/64		0.2656
	6.80	0.2677
	6.90	0.2717
	7.00	0.2756
	7.10	0.2795
9/32		0.2812
	7.20	0.2835
	7.30	0.2874
	7.40	0.2913
	7.50	0.2953
19/64		0.2969
	7.60	0.2992
	7.70	0.3032
	7.80	0.3071
	7.90	0.3110
5/16		0.3125
	8.00	0.3150
	8.10	0.3189
	8.20	0.3228
	8.30	0.3268
21/64		0.3281
	8.40	0.3307
	8.50	0.3346
	8.60	0.3386

STANDARD DRILL SIZES SUPERSEDING GAUGE AND LETTER SIZES

No. OR LETTER	STD. METRIC SIZE
80	.35
79	.38
78	.40
77	.45
76	.50
75	.52
74	.58
73	.60
72	.65
71	.65
70	.70
69	.75
68	1/32
67	.82
66	.85
65	.90
64	.92
63	.95
62	.98
61	1.00
60	1.00
59	1.05
58	1.05
57	1.10
56	3/64
55	1.30
54	1.40
53	1.50
52	1.60
51	1.70
50	1.80
49	1.85
48	1.95
47	2.00
46	2.05
45	2.10
44	2.20
43	2.25
42	3/32
41	2.45
40	2.50
39	2.55
38	2.60
37	2.65
36	2.70
35	2.80
34	2.80
33	2.85
32	2.95
31	3.00

STANDARD SIZES		
in.	m.m.	Dec.
	8.70	0.3425
11/32		0.3438
	8.80	0.3465
	8.90	0.3504
	9.00	0.3543
	9.10	0.3583
23/64		0.3594
	9.20	0.3622
	9.30	0.3661
	9.40	0.3701
	9.50	0.3740
3/8		0.3750
	9.60	0.3780
	9.70	0.3819
	9.80	0.3858
	9.90	0.3898
25/64		0.3906
	10.00	0.3937
	10.10	0.3976
	10.20	0.4016
	10.30	0.4055
13/32		0.4062
	10.40	0.4094
	10.50	0.4134
	10.60	0.4173
	10.70	0.4213
27/64		0.4219
	10.80	0.4252
	10.90	0.4291
	11.00	0.4331
	11.10	0.4370
7/16		0.4375
	11.20	0.4409
	11.30	0.4449
	11.40	0.4488
	11.50	0.4528
29/64		0.4531
	11.60	0.4567
	11.70	0.4606
	11.80	0.4646
	11.90	0.4685
15/32		0.4688
	12.00	0.4724
	12.10	0.4764
	12.20	0.4803
	12.30	0.4843
31/64		0.4844
	12.40	0.4882
	12.50	0.4921

STANDARD SIZES		
in.	m.m.	Dec.
	12.60	0.4961
1/2	12.70	0.500
	12.80	0.5039
	12.90	0.5079
	13.00	0.5118
33/64		0.5156
	13.10	0.5157
	13.20	0.5197
	13.30	0.5236
	13.40	0.5276
17/32		0.5312
	13.50	0.5315
	13.60	0.5354
	13.70	0.5394
	13.80	0.5433
35/64		0.5469
	13.90	0.5472
	14.00	0.5512
	14.25	0.5610
9/16		0.5625
	14.50	0.5709
37/64		0.5781
	14.75	0.5807
	15.00	0.5906
19/32		0.5938
	15.25	0.6004
39/64		0.6094
	15.50	0.6102
	15.75	0.6201
5/8		0.6250
	16.00	0.6299
	16.25	0.6398
41/64		0.6406
	16.50	0.6496
21/32		0.6562
	16.75	0.6594
	17.00	0.6693
43/64		0.6719
	17.25	0.6791
11/16		0.6875
	17.50	0.6890
	17.75	0.6988
45/64		0.7031
	18.00	0.7087
	18.25	0.7185
23/32		0.7188
	18.50	0.7283
47/64		0.7344
	18.75	0.7382

STANDARD SIZES		
in.	m.m.	Dec.
	19.00	0.7480
3/4		0.7500
	19.25	0.7579
49/64		0.7656
	19.50	0.7677
	19.75	0.7776
25/32		0.7812
	20.00	0.7874
51/64		0.7969
	20.25	0.7972
	20.50	0.8071
13/16		0.8125
	20.75	0.8169
	21.00	0.8268
53/64		0.8281
	21.25	0.8366
27/32		0.8438
	21.50	0.8465
	21.75	0.8563
55/64		0.8594
	22.00	0.8661
7/8		0.8750
	22.25	0.8760
	22.50	0.8858
57/64		0.8906
	22.75	0.8957
	23.00	0.9055
29/32		0.9062
	23.25	0.9154
59/64		0.9219
	23.50	0.9252
	23.75	0.9350
15/16		0.9375
	24.00	0.9449
61/64		0.9531
	24.25	0.9547
	24.50	0.9646
31/32		0.9688
	24.75	0.9744
	25.00	0.9843
63/64		0.9844
1		1.0000

STANDARDS RISE IN INCREMENTS OF 1/64 in. AND 0.50 m.m.

STANDARD DRILL SIZES SUPERSEDING GAUGE AND LETTER SIZES

No. OR LETTER	STD. METRIC SIZE
30	3.30
29	3.50
28	9/64
27	3.70
26	3.70
25	3.80
24	3.90
23	3.90
22	4.00
21	4.00
20	4.10
19	4.20
18	4.30
17	4.40
16	4.50
15	4.60
14	4.60
13	4.70
12	4.80
11	4.90
10	4.90
9	5.00
8	5.10
7	5.10
6	5.20
5	5.20
4	5.30
3	5.40
2	5.60
1	5.80
A	15/64
B	6.00
C	6.10
D	6.20
E	1/4
F	6.50
G	6.60
H	17/64
I	6.90
J	7.00
K	9/32
L	7.40
M	7.50
N	7.70
O	8.00
P	8.20
Q	8.40
R	8.60
S	8.80
T	9.10
U	9.30
V	3/8
W	9.80
X	10.10
Y	10.30
Z	10.50

STANDARD DRILL SIZES AND DECIMAL EQUIVALENTS

B.A. STANDARD THREADS

B.A.	O. DIA.	CORE	PITCH	DEPTH	RADIUS	T.P.I.
0	.2362	.1890	.0394	.0236	.0072	25.38
1	.2087	.1663	.0354	.0212	.0064	28.25
2	.1850	.1468	.0319	.0191	.0058	31.35
3	.1614	.1270	.0287	.0172	.0052	34.84
4	.1417	.1105	.0260	.0156	.0047	38.46
5	.1260	.0980	.0232	.0139	.0042	43.10
6	.1102	.0852	.0209	.0125	.0038	47.85
7	.0984	.0758	.0189	.0113	.0034	52.91
8	.0866	.0664	.0169	.0101	.0031	59.17
9	.0748	.0564	.0154	.0092	.0028	64.94
10	.0669	.0503	.0138	.0083	.0025	72.46
11	.0591	.0445	.0122	.0073	.0022	81.97
12	.0511	.0375	.0110	.0066	.0020	90.91

TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
B.A.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
0	m.m. 5.10	.2008	m.m. 5.00	.1968	6.00	0.2362
1	4.50	.1772	4.45	.1752	5.40	0.2126
2	4.00	.1575	5/32	.1562	4.80	0.1890
3	3.45	.1358	3.40	.1339	4.20	0.1645
4	3.00	.1181	2.95	.1161	3.70	0.1457
5	2.65	.1043	2.60	.1024	3.30	0.1299
6	2.30	.0906	2.25	.0886	2.85	0.1122
7	2.05	.0807	2.00	.0787	2.55	0.1004
8	1.80	.0709	1.75	.0689	2.25	0.0886
9	1.55	.0610	1.50	.0590	1.95	0.0768
10	1.40	.0551	1.35	.0532	1.80	0.0709
11	1.20	.0472	3/64	.0469	1.50	0.0591
12	1.05	.0413	1.00	.0394	1.30	0.0512

All tapping drill sizes (except where shown) and B.S. Primary and Secondary Selection of Fits, are reproduced with the full permission of the British Standards Institution, 2 Park Street, London, W.1. Where possible, British Standards recommended drills should be used, in order to ensure the greatest accuracy.

B.S.F. THREADS (55°)

DIA.	O.DIA.	CORE	PITCH	DEPTH	RADIUS	EFFEC.	T.P.I.
3/16"	.1875	.1475	.0312	.0200	.0046	.1675	32
7/32"	.2188	.1730	.0357	.0229	.0049	.1958	28
1/4"	.2500	.2008	.0385	.0246	.0053	.2254	26
5/16"	.3125	.2543	.0454	.0291	.0062	.2834	22
3/8"	.3750	.3110	.0500	.0320	.0069	.3430	20
7/16"	.4375	.3663	.0555	.0356	.0076	.4019	18
1/2"	.5000	.4200	.0625	.0400	.0086	.4600	16
9/16"	.5625	.4825	.0625	.0400	.0086	.5225	16
5/8"	.6250	.5336	.0714	.0457	.0098	.5793	14
3/4"	.7500	.6432	.0833	.0534	.0114	.6966	12
7/8"	.8750	.7586	.0909	.0582	.0125	.8168	11
1"	1.0000	.8720	.1000	.0640	.0137	.9360	10
1 1/8	1.1250	.9828	.1111	.0711	.0153	1.0539	9
1 1/4	1.2500	1.1078	.1111	.0711	.0153	1.1789	9
1 3/8	1.3750	1.2150	.1250	.0800	.0172	1.2950	8
1 1/2	1.5000	1.3400	.1250	.0800	.0172	1.4200	8
1 5/8	1.6250	1.4649	.1250	.0800	.0172	1.5450	8
1 3/4	1.7500	1.5670	.1429	.0915	.0196	1.6585	7
2"	2.0000	1.8170	.1429	.0915	.0196	1.9085	7
2 1/4	2.2500	2.0366	.1666	.1067	.0229	2.1433	6
2 1/2	2.5000	2.2866	.1666	.1067	.0229	2.3933	6
2 3/4	2.7500	2.5366	.1666	.1067	.0229	2.6433	6
3"	3.0000	2.7439	.2000	.1280	.0275	2.8719	5

TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
Dia.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
	m.m.		m.m.			
3/16	5/32	.1562	3.95	.1555	4.90	0.1929
7/32	4.65	.1831	4.60	.1811	5.60	0.2205
1/4	5.30	.2087	5.25	.2067	6.50	0.2559
5/16	6.75	.2657	17/64	.2656	8.00	0.3150
3/8	8.25	.3248	8.20	.3228	9.80	0.3858
7/16	9.70	.3819	9.60	.3780	29/64	0.4531
1/2	7/16	.4375	11.10	.4370	33/64	0.5156
9/16	1/2	.5000	12.60	.4961	37/64	0.5781
5/8	14.00	.5512	35/64	.5469	41/64	0.6406
3/4	16.75	.6594	21/32	.6562	49/64	0.7656
7/8	25/32	.7812	19.75	.7776	57/64	0.8906
1"	22.75	.8957	57/64	.8906	1 1/64	1.0156
1 1/8	25.50	1.0039	1"	1.0000	1 9/64	1.1406
1 1/4	28.75	1.1319	1 1/8	1.1250	1 17/64	1.2656
1 3/8	31.50	1.2402	1 15/64	1.2344	1 25/64	1.3906
1 1/2	1 23/64	1.3594	35.50	1.3583	1 33/64	1.5156

WHITWORTH THREADS 55°

DIA.	0 .DIA.	CORE	PITCH	DEPTH	R'DIUS	EFFEC.	T.P.I.
1/8	.1250	.0930	.0250	.0160	.0034	.1090	40
3/16	.1875	.1341	.0417	.0267	.0057	.1608	24
1/4	.2500	.1860	.0500	.0320	.0069	.2180	20
5/16	.3125	.2414	.0556	.0356	.0076	.2769	18
3/8	.3750	.2950	.0625	.0400	.0086	.3350	16
7/16	.4375	.3460	.0714	.0457	.0098	.3918	14
1/2	.5000	.3933	.0833	.0534	.0114	.4466	12
9/16	.5625	.4558	.0833	.0534	.0114	.5091	12
5/8	.6250	.5086	.0909	.0582	.0125	.5668	11
3/4	.7500	.6219	.1000	.0640	.0137	.6860	10
7/8	.8750	.7327	.1111	.0711	.0153	.8039	9
1"	1.0000	.8399	.1250	.0800	.0172	.9200	8
1 1/8	1.1250	.9420	.1429	.0915	.0196	1.0335	7
1 1/4	1.2500	1.0670	.1429	.0915	.0196	1.1585	7
1 1/2	1.5000	1.2866	.1667	.1067	.0229	1.3933	6
1 3/4	1.7500	1.4939	.2000	.1281	.0275	1.6219	5
2"	2.0000	1.7154	.2222	.1423	.0305	1.8577	4½

TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
Dia.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
1/8	m.m. 2.55	.1004	m.m. 2.50	.0984	3.30	0.1299
3/16	3.70	.1457	3.65	.1437	5.00	0.1968
1/4	5.10	.2008	5.00	.1968	6.50	0.2559
5/16	6.50	.2559	6.40	.2520	8.00	0.3150
3/8	5/16	.3125	7.90	.3110	9.80	0.3858
7/16	9.25	.3642	9.20	.3622	29/64	0.4531
1/2	10.50	.4134	10.40	.4094	33/64	0.5156
9/16	12.10	.4764	12.00	.4724	37/64	0.5781
5/8	13.50	.5315	17/32	.5312	41/64	0.6406
3/4	41/64	.6406	16.25	.6398	49/64	0.7656
7/8	19.25	.7579	3/4	.7500	57/64	0.8906
1"	22.00	.8661	55/64	.8594	1 1/64	1.0156
1 1/8	24.75	.9744	31/32	.9688	1 9/64	1.1406
1 1/4	1 3/32	1.0938	27.50	1.0827	1 17/64	1.2656
1 1/2	33.50	1.3189	1 5/16	1.3125	1 33/64	1.5156
1 3/4	39.00	1.5354	1 17/32	1.5312	1 57/64	1.8906
2"	44.50	1.7520	1 3/4	1.7500	2 1/64	2.0156

BRITISH STANDARD PIPE THREADS

Size	O.D.	Core	Pitch	Depth	Radius	Effec.	T.P.I.	O.D.P.
1/8	.383	.337	.0357	.0229	.0049	.3601	28	13/32
1/4	.518	.451	.0526	.0335	.0072	.4845	19	17/32
3/8	.656	.589	.0526	.0335	.0072	.6225	19	11/16
1/2	.825	.734	.0714	.0457	.0098	.7793	14	27/32
5/8	.902	.811	.0714	.0457	.0098	.8563	14	15/16
3/4	1.041	.950	.0714	.0457	.0098	.9953	14	1 1/16
7/8	1.189	1.098	.0714	.0457	.0098	1.1433	14	1 7/32
1"	1.309	1.193	.0909	.0582	.0125	1.2508	11	1 3/8
1 1/4	1.650	1.534	.0909	.0582	.0125	1.5918	11	1 11/16
1 1/2	1.882	1.766	.0909	.0582	.0125	1.8238	11	1 29/32
1 3/4	2.116	2.000	.0909	.0582	.0125	2.0578	11	2 5/32
2"	2.347	2.231	.0909	.0582	.0125	2.2888	11	2 3/8

TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
Dia.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
1/8	m.m. 8.75	.3445	m.m. 11/32	.3438	9.80	0.3858
1/4	11.80	.4646	11.75	.4626	17/32	0.5312
3/8	15.25	.6004	19/32	.5938	43/64	0.6719
1/2	3/4	.7500	19.00	.7480	53/64	0.8281
5/8	53/64	.8281	21.00	.8268	29/32	0.9062
3/4	24.50	.9646	24.25	.9547	1 3/64	1.0469
7/8	28.25	1.1122	1 7/64	1.1094	1 13/64	1.2031
1"	30.75	1.2106	1 13/64	1.2031	1 5/16	1.3125
1 1/4	39.50	1.5551	1 35/64	1.5469	1 21/32	1.6562
1 1/2	1 25/32	1.7812	45.00	1.7716	1 57/64	1.8906
1 3/4	51.00	2.0079	—	—	2 1/8	2.1250
2"	2 1/4	2.2500	57.00	2.2442	2 23/64	2.3594

UNIFIED SCREW THREADS
BELOW 1/4" FOR ATTACHMENT PURPOSES

Designation	O.Dia.	Core Dia. Nut	Core Dia. Bolt	Pitch	Depth	Effec.
4—40 UNC	.112	.0849	.0813	.02500	.01534	.0958
6—32 UNC	.138	.1042	.0997	.03125	.01917	.1177
8—32 UNC	.164	.1302	.1257	.03125	.01917	.1437
10—32 UNF	.190	.1562	.1517	.03125	.01917	.1697
*10—24 UNC	.190	.1449	.1389	.04167	.02556	.1629

* Non Preferred

A.N.C. THREADS (60°)

No.	O.DIA.	CORE	PITCH	DEPTH	FLAT	EFFEC.	T.P.I.
1	.0730	.0527	.0156	.0101	.0019	.0629	64
2	.0860	.0628	.0178	.0116	.0022	.0744	56
3	.0990	.0719	.0208	.0135	.0026	.0855	48
4	.1120	.0795	.0250	.0162	.0031	.0958	40
5	.1250	.0925	.0250	.0162	.0031	.1088	40
6	.1380	.0974	.0312	.0203	.0039	.1177	32
8	.1640	.1234	.0312	.0203	.0039	.1437	32
10	.1900	.1359	.0416	.0270	.0052	.1629	24
12	.2160	.1619	.0416	.0270	.0052	.1889	24

TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
Dia.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
1	m.m. 1.55	.0610	m.m. 1.50	.0590	1.95	0.0768
2	1.85	.0728	1.80	.0709	2.25	0.0886
3	2.10	.0827	2.05	.0807	2.65	0.1043
4	2.35	.0925	2.30	.0906	2.95	0.1161
5	2.65	.1043	2.60	.1024	3.30	0.1299
6	2.85	.1122	2.80	.1102	9/64	0.1406
8	3.50	.1378	3.45	.1358	4.30	0.1693
10	3.90	.1535	3.85	.1516	5.00	0.1968
12	4.55	.1791	4.50	.1772	5.60	0.2205

A.N.F. THREADS (60°)

No.	O.DIA.	CORE	PITCH	DEPTH.	FLAT	EFFEC.	T.P.I.
0	.0600	.0438	.0125	.0081	.0015	.0519	80
1	.0730	.0550	.0139	.0091	.0017	.0640	72
2	.0860	.0657	.0156	.0101	.0019	.0759	64
3	.0990	.0758	.0178	.0116	.0022	.0874	56
4	.1120	.0849	.0208	.0135	.0026	.0985	48
5	.1250	.0955	.0227	.0147	.0028	.1102	44
6	.1380	.1055	.0250	.0162	.0031	.1218	40
8	.1640	.1279	.0278	.0180	.0035	.1460	36
10	.1900	.1494	.0312	.0203	.0039	.1697	32
12	.2160	.1696	.0357	.0232	.0044	.1928	28

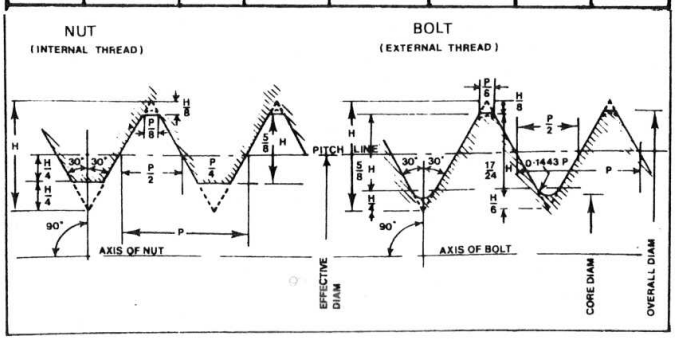
TAPPING DRILLS

B.S.I. RECOMMENDED			B.S.I. ALTERNATE		CLEARANCE DRILLS	
Dia.	Drill	Dec.	Drill	Dec.	m.m.	Dec.
0	m.m. 1.25	.0492	m.m. 1.20	.0472	1.70	0.0669
1	1.60	.0630	1/16	.0625	2.00	0.0787
2	1.90	.0748	1.85	.0728	3/32	0.0938
3	2.15	.0846	2.10	.0827	2.70	0.1063
4	2.40	.0945	3/32	.0938	2.95	0.1161
5	2.70	.1063	2.65	.1043	3.50	0.1378
6	2.95	.1161	2.90	.1142	3.70	0.1457
8	3.55	.1398	3.50	.1378	4.40	0.1732
10	4.10	.1614	4.05	.1595	5.00	0.1968
12	4.65	.1831	4.60	.1811	5.60	0.2205

I.S.O. METRIC COARSE THREADS

NOTE:—All dimensions in mm.'s

O.Dia.	Core	Pitch	Depth	Flat	Effec.	Tapp'g Drill	Cl'ance Drill
1.6	1.1706	0.35	0.2147	0.04375	1.373	1.25	1.65
1'8	1.3706	0.35	0.2147	0.04375	1.573	1.45	1.85
2.0	1.5092	0.40	0.2454	0.05000	1.740	1.60	2.05
2.2	1.6480	0.45	0.2760	0.05625	1.908	1.75	2.25
2.5	1.9480	0.45	0.2760	0.05625	2.208	2.05	2.60
3.0	2.3866	0.50	0.3067	0.06250	2.675	2.50	3.10
3.5	2.7638	0.60	0.3681	0.07500	3.110	2.90	3.60
4.0	3.1412	0.70	0.4294	0.08750	3.545	3.30	4.10
4.5	3.5798	0.75	0.4601	0.09375	4.013	3.80	4.60
5,0	4 0184	0 80	0 4908	0 10000	4 480	4 20	5 10
6.0	4.7732	1.00	0.6134	0.12500	5.350	5.00	6.10
7.0	5.7732	1.00	0.6134	0.12500	6.350	6.00	7.20
8·0	6.4664	1.25	0.7668	0.15625	7.188	6.80	8.20
10.0	8.1596	1.50	0.9202	0.18750	9.026	8.50	10.20
12.0	9.8530	1.75	1.0735	0.21875	10.863	10.20	12.20
14.0	11.5462	2.00	1.2269	0.25000	12.701	12.00	14.25
16.0	13.5462	2.00	1,2269	0.25000	14.701	14.00	16.25
18.0	14.9328	2.50	1.5336	0.31250	16.376	15.50	18.25
20.0	16.9328	2.50	1.5336	0.31250	18.376	17.50	20.25
22.0	18.9328	2.50	1.5336	0.31250	20.376	19.50	22.25
24.0	20.3194	3.00	1.8403	0.37500	22.051	21.00	24.25
27.0	23.3194	3.00	1.8403	0.37500	25.051	24.00	27.25
30.0	25.7060	3.50	2.1470	0.43750	27.727	26.50	30.50
33.0	28.7060	3.50	2,1470	0.43750	30.727	29.50	33.50
36.0	31.0924	4.00	2.4538	0.50000	33,402	32.00	36.50
39.0	34.0924	4.00	2.4538	0.50000	36.402	35.00	39.50
42.0	36.4790	4.50	2.7605	0.56250	39.077	37.50	42.50
45.0	39.4790	4.50	2.7605	0.56250	42.077	40.50	45.50
48.0	41.8646	5.00	3.0672	0.62500	44.752	43.00	48.75
52.0	45.8646	5.00	3.0672	0.62500	48.752	47.00	52.75
56.0	49.2522	5.50	3.3739	0.68750	52.428	50.50	56.75
60.0	53.2522	5.50	3.3739	0.68750	56.428	54.50	60.75
64.0	56.6388	6.00	3.6806	0.75000	60.103	58.00	64.75
68.0	60.6388	6.00	3.6806	0.75000	64.103	62.00	68.75



U.N.F.
FINE THREAD SERIES
UNIFIED SCREW THREADS (BASIC SIZES)

B.S. 1580: 1962

DESIG'TION	O.DIA. Maj. dia	CORE DIA. Nut †	CORE DIA. Bolt ‡	PITCH	DEPTH	EFFEC.
1/4– 28 UNF	0.2500	0.2113	0.2062	.03571	.02191	0.2268
5/16– 24 UNF	0.3125	0.2674	0.2614	.04167	.02556	0.2854
3/8– 24 UNF	0.3750	0.3299	0.3239	.04167	.02556	0.3479
7/16– 20 UNF	0.4375	0.3834	0.3762	.05000	.03067	0.4050
1/2– 20 UNF	0.5000	0.4459	0.4387	.05000	.03067	0.4675
9/16– 18 UNF	0.5625	0.5024	0.4943	.05556	.03408	0.5264
5/8– 18 UNF	0.6250	0.5649	0.5568	.05556	.03408	0.5889
3/4– 16 UNF	0.7500	0.6823	0.6733	.06250	.03834	0.7094
7/8– 14 UNF	0.8750	0.7977	0.7874	.07143	.04382	0.8286
1"– 12 UNF	1.0000	0.9098	0.8978	.08333	.05112	0.9459
1 1/8– 12 UNF	1.1250	1.0348	1.0228	.08333	.05112	1.0709
1 1/4–12 UNF	1.2500	1.1598	1.1478	.08333	.05112	1.1959
1 3/8–12 UNF	1.3750	1.2848	1.2728	.08333	.05112	1.3209
1 1/2–12 UNF	1.5000	1.4098	1.3978	.08333	.05112	1.4459

† Corresponds to a Flat of P/4: ‡ Corresponds to a Radius of .144 P (No Allowance)

TAPPING DRILLS

B.S.I. RECOMMENDED Dia.	Drill	Dec.	B.S.I. ALTERNATE Drill	Dec.	CLEARANCE DRILLS mm.	Dec.
1/4	m.m. 5.50	.2165	m.m. 5.40	.2126	6.50	0.2559
5/16	6.90	.2717	6.80	.2677	8.00	0.3150
3/8	8.50	.3346	8.40	.3307	9.80	0.3858
7/16	9.90	.3898	9.80	.3858	29/64	0.4531
1/2	11.40	.4488	—	—	33/64	0.5156
9/16	12.90	.5079	12.80	.5039	37/64	0.5781
5/8	14.50	.5709	—	—	41/64	0.6406
3/4	11/16	.6875	—	—	49/64	0.7656
7/8	*.804	*.804	—	—	57/64	0.8906
1"	23.25	.9154	—	—	1 1/64	1.0156
1 1/8	26.50	1.0433	—	—	1 9/64	1.1406
1 1/4	29.50	1.1614	—	—	1 17/64	1.2656
1 3/8	*1.290	*1.290	—	—	1 25/64	1.3906
1 1/2	36.00	1.4173	—	—	1 33/64	1.5156

*New Stock Sizes

U.N.C.
COARSE THREAD SERIES
UNIFIED SCREW THREADS (BASIC SIZES)

B.S. 1580: 1962

DESIG'TION	O.DIA.	CORE DIA. NUT†	CORE DIA. BOLT‡	PITCH	DEPTH	EFFEC.
1/4– 20 UNC	0.2500	0.1959	0.1887	.05000	.03067	0.2175
5/16– 18 UNC	0.3125	0.2524	0.2443	.05556	.03408	0.2764
3/8– 16 UNC	0.3750	0.3073	0.2983	.06250	.03834	0.3344
7/16– 14 UNC	0.4375	0.3602	0.3499	.07143	.04382	0.3911
1/2– 13 UNC	0.5000	0.4167	0.4056	.07692	.04719	0 4500
9/16– 12 UNC	0.5625	0.4723	0.4603	.08333	.05112	0.5084
5/8– 11 UNC	0.6250	0.5266	0.5135	.09091	.05577	0.5660
3/4– 10 UNC	0.7500	0.6417	0.6273	.10000	.06134	0.6850
7/8– 9 UNC	0.8750	0.7547	0.7387	.11111	.06816	0.8028
1"– 8 UNC	1.0000	0.8647	0.8466	.12500	.07668	0.9188
1 1/8 – 7 UNC	1.1250	0.9704	0.9497	.14286	.08763	1.0322
1 1/4 – 7 UNC	1.2500	1.0954	1.0747	.14286	.08763	1.1572
1 3/8– 6 UNC	1.3750	1.1946	1.1705	.16667	.10224	1.2667
1 1/2 – 6 UNC	1.5000	1.3196	1.2955	.16667	.10224	1.3917
1 3/4 – 5 UNC	1.7500	1.5335	1.5046	.20000	.12269	1.6201
2"– 4 1/2 UNC	2.0000	1.7594	1.7274	.22222	.13632	1.8557

‡ Corresponds to a Flat of P/4: ‡ Corresponds to Radius of .144P (no Allowance)

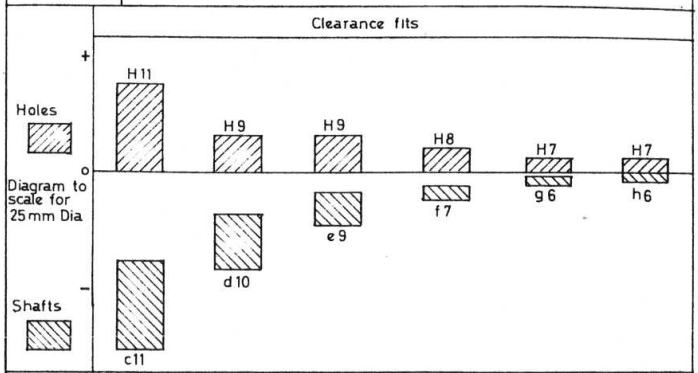
TAPPING DRILLS

B.S.I. RECOMMENDED Dia.	Drill	Dec.	B.S.I. ALTERNATE Drill	Dec.	CLEARANCE DRILLS m.m.	Dec.
1/4	m.m. 5.20	.2047	m.m. 13/64	.2031	6.50	0.2559
5/16	6.60	.2598	6.50	.2559	8.00	0.3150
3/8	8.00	.3150	5/16	.3125	9.80	0.3858
7/16	9.40	.3701	9.30	.3661	29/64	0.4531
1/2	10.80	.4253	10.75	.4232	33/64	0.5156
9/16	12.25	.4823	12.20	.4803	37/64	0.5781
5/8	13.50	.5315	17/32	.5312	41/64	0.6406
3/4	16.50	.6496	—	—	49/64	0.7656
7/8	49/64	.7656	19.25	.7579	57/64	0.8906
1"	22.25	.8760	7/8	.8750	1 1/64	1.0156
1 1/8	63/64	.9844	25.00	.9842	1 9/64	1.1406
1 1/4	1 7/64	1.1094	28.00	1.1024	1 17/64	1.2656
1 3/8	30.75	1.2106	1 13/64	1.2031	1 25/64	1.3906
1 1/2	1 21/64	1.3281	—	—	1 33/64	1.5156
1 3/4	1 35/64	1.5469	39.00	1.5354	1 57/64	1.8906
2"	1 25/32	1.7812	45.00	1.7716	2 1/64	2.0156

Extracted from BS 4500:1969

BRITISH STANDARD DATA SHEET No. 4500 A.

SELECTED ISO FIT — HOLE BASIS (SHEET No.1.)



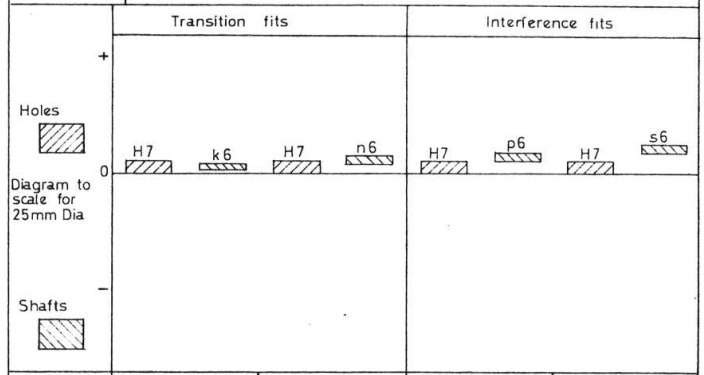
Nom sizes		Tolerance		Tolerance		Tolerance		Tolerance		Tolerance		Tolerance	
Over	To	H11	c11	H9	d10	H9	e9	H8	f7	H7	g6	H7	h6
mm	mm	0·001	0·001	0·001	0·001	0·001	0·001	0·001	0·001	0·001	0·001	0·001	0·001
–	3	+ 60 0	– 60 – 120	+ 25 0	– 20 – 60	+ 25 0	– 14 – 39	+ 14 0	– 6 – 16	+ 10 0	– 2 – 8	+ 10 0	– 6 0
3	6	+ 75 0	– 70 – 145	+ 30 0	– 30 – 78	+ 30 0	– 20 – 50	+ 18 0	– 10 – 22	+ 12 0	– 4 – 12	+ 12 0	– 8 0
6	10	+ 90 0	– 80 – 170	+ 36 0	– 40 – 98	+ 36 0	– 25 – 61	+ 22 0	– 13 – 28	+ 15 0	– 5 – 14	+ 15 0	– 9 0
10	18	+ 110 0	– 95 – 205	+ 43 0	– 50 – 120	+ 43 0	– 32 – 75	+ 27 0	– 16 – 34	+ 18 0	– 6 – 17	+ 18 0	– 11 0
18	30	+ 130 0	– 110 – 240	+ 52 0	– 65 – 149	+ 52 0	– 40 – 92	+ 33 0	– 20 – 41	+ 21 0	– 7 – 20	+ 21 0	– 13 0
30	40	+ 160 0	– 120 – 280	+ 62 0	– 80 – 180	+ 62 0	– 50 – 112	+ 39 0	– 25 – 50	+ 25 0	– 9 – 25	+ 25 0	– 16 0
40	50	+ 160 0	– 130 – 290										
50	65	+ 190 0	– 140 – 330	+ 74 0	– 100 – 220	+ 74 0	– 60 – 134	+ 46 0	– 30 – 60	+ 30 0	– 10 – 29	+ 30 0	– 19 0
65	80	+ 190 0	– 150 – 340										
80	100	+ 220 0	– 170 – 390	+ 87 0	– 120 – 260	+ 87 0	– 72 – 159	+ 54 0	– 36 – 71	+ 35 0	– 12 – 34	+ 35 0	– 22 0
100	120	+ 220 0	– 180 – 400										
120	140	+ 250 0	– 200 – 450	+ 100 0	– 145 – 305	+ 100 0	– 84 – 185	+ 63 0	– 43 – 83	+ 40 0	– 14 – 39	+ 40 0	– 25 0
140	160	+ 250 0	– 210 – 460										
160	180	+ 250 0	– 230 – 480										
180	200	+ 290 0	– 240 – 530	+ 115 0	– 170 – 355	+ 115 0	– 100 – 215	+ 72 0	– 50 – 96	+ 46 0	– 15 – 44	+ 46 0	– 29 0
200	225	+ 290 0	– 260 – 550										
225	250	+ 290 0	– 280 – 570										
250	280	+ 320 0	– 300 – 620	+ 130 0	– 190 – 400	+ 130 0	– 110 – 240	+ 81 0	– 56 – 108	+ 52 0	– 17 – 49	+ 52 0	– 32 0
280	315	+ 320 0	– 330 – 650										
315	355	+ 360 0	– 360 – 720	+ 140 0	– 210 – 440	+ 140 0	– 125 – 265	+ 89 0	– 62 – 119	+ 57 0	– 18 – 54	+ 57 0	– 36 0
355	400	+ 360 0	– 400 – 760										
400	450	+ 400 0	– 440 – 840	+ 155 0	– 230 – 480	+ 155 0	– 135 – 290	+ 97 0	– 68 – 131	+ 63 0	– 20 – 60	+ 63 0	– 40 0
450	500	+ 400 0	– 480 – 880										

BRITISH STANDARDS INSTITUTION, 2 Park Street, London, W1A 2BS.

Extracted from BS 4500:1969

BRITISH STANDARD SHEET No. 4500 A.

SELECTED ISO FITS — HOLE BASIS (Sheet No. 2.)



Nom sizes		Tolerance		Tolerance		Tolerance		Tolerance	
Over	To	H7	k6	H7	n6	H7	p6	H7	s6
mm	mm	0·001	0 001	0·001	0·001	0·001	0·001	0·001	0·001
	3	+ 10 0	+ 6 0	+ 10 0	+ 10 + 4	+ 10 0	+ 12 + 6	+ 10 0	+ 20 + 14
3	6	+ 12 0	+ 9 + 1	+ 12 0	+ 16 + 8	+ 12 0	+ 20 + 12	+ 12 0	+ 27 + 19
6	10	+ 15 0	+ 10 + 1	+ 15 0	+ 19 + 10	+ 15 0	+ 24 + 15	+ 15 0	+ 32 + 23
10	18	+ 18 0	+ 12 + 1	+ 18 0	+ 23 + 12	+ 18 0	+ 29 + 18	+ 18 0	+ 39 + 28
18	30	+ 21 0	+ 15 + 2	+ 21 0	+ 28 + 15	+ 21 0	+ 35 + 22	+ 21 0	+ 48 + 35
30	40	+ 25 0	+ 18 + 2	+ 25 0	+ 33 + 17	+ 25 0	+ 42 + 26	+ 25 0	+ 59 + 43
40	50								
50	65	+ 30 0	+ 21 + 2	+ 30 0	+ 39 + 20	+ 30 0	+ 51 + 32	+ 30 + 0 + 30 0	+ 72 + 53 + 78 + 59
65	80								
80	100	+ 35 0	+ 25 + 3	+ 35 0	+ 45 + 23	+ 35 0	+ 59 + 37	+ 35 0 + 35 0	+ 93 + 71 + 101 + 79
100	120								
120	140	+ 40 0	+ 28 + 3	+ 40 0	+ 52 + 27	+ 40 0	+ 68 + 43	+ 40 0 + 40 0 + 40 0	+ 117 + 92 + 125 + 100 + 133 + 108
140	160								
160	180								
180	200	+ 46 0	+ 33 + 4	+ 46 0	+ 60 + 31	+ 46 0	+ 79 + 50	+ 46 0 + 46 0 + 46 0	+ 151 + 122 + 159 + 130 + 169 + 140
200	225								
225	250								
250	280	+ 52 0	+ 36 + 4	+ 52 0	+ 66 + 34	+ 52 0	+ 88 + 56	+ 52 0 + 52 0	+ 190 + 158 + 202 + 170
280	315								
315	355	+ 57 0	+ 40 + 4	+ 57 0	+ 73 + 37	+ 57 0	+ 98 + 62	+ 57 0 + 57 0	+ 226 + 190 + 244 + 208
355	400								
400	450	+ 63 0	+ 45 + 5	+ 63 0	+ 80 + 40	+ 63 0	+ 108 + 68	+ 63 0 + 63 0	+ 272 + 232 + 292 + 252
450	500								

BRITISH STANDARDS INSTITUTION, 2 Park Street, London, W1A 2BS.

HARDNESS COMPARISON TABLE

BY COURTESY OF MACHINERY PUBLISHING CO LTD

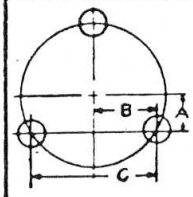
BRINELL 10 m/m Ball 3000 Kg Load.	FIRTH or VICKERS 120 Kg.	ROCKWELL C. Scale 120° Cone 150 Kg. Load.	ROCKWELL B. Scale 1/16" Ball 100 Kg. Load.	BRINELL 10 m/m Ball 3000 Kg Load.	FIRTH or VICKERS 120 Kg.	ROCKWELL C. Scale 120° Cone 150 Kg. Load.	ROCKWELL B. Scale 1/16" Ball 100 Kg. Load.
800	—	72	—	276	278	30	105
780	1220	71	—	269	272	29	104
760	1170	70	—	261	261	28	103
745	1114	68	—	258	258	27	102
725	1060	67	—	255	255	26	102
712	1021	66	—	249	250	25	101
682	940	65	—	245	246	24	100
668	905	64	—	240	240	23	99
652	867	63	—	237	235	23	99
626	803	62	—	229	226	22	98
614	775	61	—	224	221	21	97
601	746	60	—	217	217	20	96
590	727	59	—	211	213	19	95
576	694	57	—	206	209	18	94
552	649	56	—	203	201	17	94
545	639	55	—	200	199	16	93
529	606	54	—	196	197	15	92
514	587	53	120	191	190	14	92
502	565	52	119	187	186	13	91
495	551	51	119	185	184	12	91
477	534	49	118	183	183	11	90
461	502	48	117	180	177	10	89
451	489	47	117	175	174	9	88
444	474	46	116	170	171	7	87
427	460	45	115	167	168	6	87
415	435	44	115	165	165	5	86
401	423	43	114	163	162	4	85
388	401	42	114	160	159	3	84
375	390	41	113	156	154	2	83
370	385	40	112	154	152	1	82
362	380	39	111	152	150	—	82
351	361	38	111	150	149	—	81
346	352	37	110	147	147	—	80
341	344	37	110	145	146	—	79
331	335	36	109	143	144	—	79
323	320	35	109	141	142	—	78
311	312	34	108	140	141	—	77
301	305	33	107	135	135	—	75
293	291	32	106	130	130	—	72
285	285	31	105	—	—	—	—

* THE ABOVE TABLES ARE APPROXIMATE.

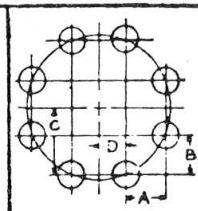
HARDNESS COMPARISON TABLE

CO-ORDINATES FOR LOCATING EQUALLY SPACED HOLES IN JIG BORING

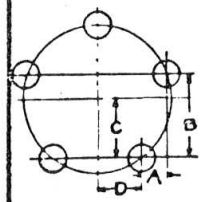
Multiply values shown by diameter of pitch circle



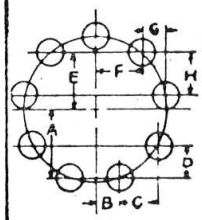
3 HOLE
A = 0·25000
B = 0·43301
C = 0·86603



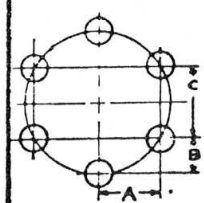
8 HOLE
A = 0·27059
B = 0·27059
C = 0·46194
D = 0·19134



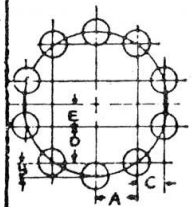
5 HOLE
A = 0·18164
B = 0·55902
C = 0·40451
D = 0·29389



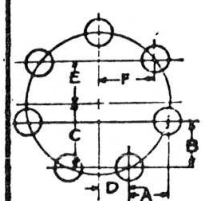
9 HOLE
A = 0·46985
B = 0·17101
C = 0·26201
D = 0·21985
E = 0·38302
F = 0·32139
G = 0·17101
H = 0·29620



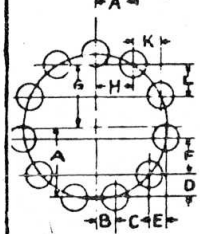
6 HOLE
A = 0·43301
B = 0·25000
C = 0·50000



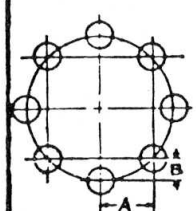
10 HOLE
A = 0·29389
B = 0·09549
C = 0·18164
D = 0·25000
E = 0·15451



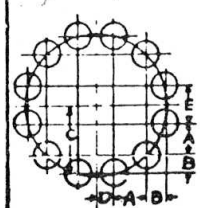
7 HOLE
A = 0·27052
B = 0·33922
C = 0·45049
D = 0·21694
E = 0·31175
F = 0·39092



11 HOLE
A = 0·47975
B = 0·14087
C = 0·23700
D = 0·15231
E = 0·11704
F = 0·25627
G = 0·42063
H = 0·27032
K = 0·18449
L = 0·21291



8 HOLE
A = 0·35355
B = 0·14645



12 HOLE
A = 0·22415
B = 0·12941
C = 0·48296
D = 0·12941
E = 0·25882

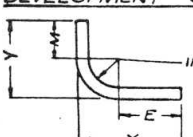
The constants in the table are multiplied by the diameter of the bolt-hole pitch circle to obtain the longitudinal and lateral adjustments of the right-angle slides of the jig borer, in boring equally spaced holes. While holes may be located by these right-angular measurements, an auxiliary rotary table provides a more direct method. With a rotary table the holes are spaced by precise angular movements after adjustment to the required radius.

ALLOWANCES FOR SHEET METAL BENDING

90° STANDARD WIRE GAUGE AND EQUIVALENT IN DECIMAL INCHES

INSIDE BEND RADIUS	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
DEC	·020	·022	·024	·028	·032	·036	·040	·048	·056	·064	·072	·080	·092	·104	·116	·128	·144	·160	·176	·192
3/8	·605	·606	·608	·611	·614	·617	·620	·626	·632	·639	·645	·651	·661	·671	·679	·688	·702	·715	·728	·740
11/32	·556	·557	·559	·562	·565	·568	·571	·577	·583	·590	·596	·603	·612	·621	·631	·640	·653	·666	·678	·691
5/16	·507	·508	·510	·513	·516	·519	·522	·528	·534	·541	·547	·553	·563	·572	·582	·591	·604	·617	·630	·643
9/32	·458	·459	·461	·464	·467	·470	·473	·479	·485	·492	·498	·504	·513	·524	·533	·542	·555	·568	·581	·594
1/4	·408	·410	·412	·415	·418	·421	·425	·430	·436	·443	·449	·456	·465	·474	·484	·493	·506	·519	·532	·545
7/32	·359	·361	·363	·366	·369	·372	·375	·381	·389	·396	·402	·408	·418	·427	·437	·446	·459	·472	·485	·498
3/16	·310	·312	·314	·317	·320	·323	·326	·332	·338	·345	·351	·357	·367	·376	·386	·395	·408	·421	·434	
5/32	·262	·265	·268	·271	·275	·278	·284	·290	·297	·303	·309	·319	·328	·338	·347	·360	·373			
1/8	·212	·214	·216	·219	·222	·225	·228	·234	·240	·247	·253	·259	·269	·278	·288					
1/64	·188	·189	·191	·194	·197	·200	·203	·209	·215	·222	·228	·234	·244	·253						
3/32	·163	·165	·167	·170	·173	·176	·179	·185	·191	·198	·204	·210								
5/64	·139	·140	·142	·145	·148	·151	·154	·160	·166	·173	·179									
1/16	·114	·115	·117	·120	·123	·126	·130	·136	·142											
1/64	·089	·091	·093	·096	·099	·102	·105													
1/32	·065	·066	·071	·071																

DEVELOPMENT OF 90° BEND



$E = X-(R+t)$

$M = Y-(R+t)$

M	BA	E

BA FOR 90° READ FROM ABOVE TABLES

BA. FOR ANGLES OVER OR UNDER 90° IS BA. FOR 90° MULTIPLIED BY $\frac{\text{BEND ANGLE}}{90°}$

i.e. BA. FOR 120° ON RADIUS $\frac{1}{8}$" AND THICKNESS OF 16 S.W.G.

$= \cdot247 \times \frac{120}{90} = \cdot247 \times 1\cdot333$

$= \cdot329$

NOTE CHART IS FOR MALLEABLE METALS WHERE NEUTRAL AXIS LIES MIDWAY THRO' THICKNESS,

FORMULA FOR BA. = $\frac{2\pi R \times \text{BEND ANGLE}}{360}$

WHERE R IS TO THE NEUTRAL LINE AND = INSIDE RADIUS + FRACTION OF THICKNESS

FOR BENDS OVER AND UNDER 90°

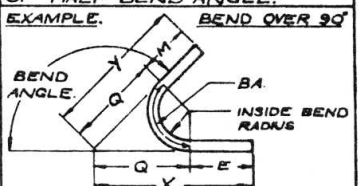
LENGTH OF MTL. REQUIRED TO FORM BEND = E + BA + M

WHERE [E = X − Q], [M = Y − Q],

BA. = BEND ALLOWANCE. AND

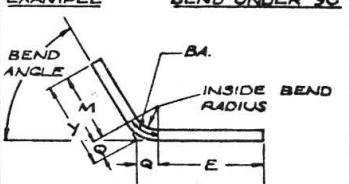
Q = [INSIDE BEND RADIUS + THE THICKNESS] X TANGENT VALUE OF HALF BEND ANGLE.

EXAMPLE. BEND OVER 90°



M	BA	E

EXAMPLE BEND UNDER 90°

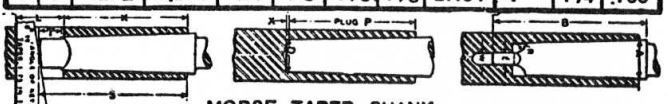


M	BA	E

MORSE TAPER SLEEVES.

A = No. MORSE TAPER OUTSIDE B = No. MORSE TAPER INSIDE

A	B	C	D	E	F	G	H	I	K	L	M
2	1	3 9/16	0.700	5/8	1/4	7/16	2 3/16	0.475	2 1/16	3/4	.213
3	1	3 15/16	0.938	1/4	5/16	9/16	2 3/16	0.475	2 1/16	3/4	.213
3	2	4 7/16	0.938	3/4	5/16	9/16	2 5/8	0.700	2 1/2	7/8	.260
4	1	4 7/8	1.231	1/4	15/32	5/8	2 3/16	0.475	2 1/16	3/4	.213
4	2	4 7/8	1.231	1/4	15/32	5/8	2 5/8	0.700	2 1/2	7/8	.260
4	3	5 3/8	1.231	3/4	15/32	5/8	3 1/4	0.938	3 1/16	1 3/16	.322
5	1	6 1/8	1.748	1/4	5/8	3/4	2 3/16	0.475	2 1/16	3/4	.213
5	2	6 1/8	1.748	1/4	5/8	3/4	2 5/8	0.700	2 1/2	7/8	.260
5	3	6 1/8	1.748	1/4	5/8	3/4	3 1/4	0.938	3 1/16	1 3/16	.322
5	4	6 5/8	1.748	3/4	5/8	3/4	4 1/8	1.231	3 7/8	1 1/4	.478
6	1	8 5/8	2.494	3/8	3/4	1 1/8	2 3/16	0.475	2 1/16	3/4	.213
6	2	8 5/8	2.494	3/8	3/4	1 1/8	2 5/8	0.700	2 1/2	7/8	.260
6	3	8 5/8	2.494	3/8	3/4	1 1/8	3 1/4	0.938	3 1/16	1 3/16	.322
6	4	8 5/8	2.494	3/8	3/4	1 1/8	4 1/8	1.231	3 7/8	1 1/4	.478
6	5	8 5/8	2.494	3/8	3/4	1 1/8	5 1/4	1.748	4 15/16	1 1/2	.635
7	3	11 5/8	3.270	3/8	1 1/8	1 3/8	3 1/4	0.938	3 1/16	1 3/16	.322
7	4	11 5/8	3.270	3/8	1 1/8	1 3/8	4 1/8	1.231	3 7/8	1 1/4	.478
7	5	11 5/8	3.270	3/8	1 1/8	1 3/8	5 1/4	1.748	4 15/16	1 1/2	.635
7	6	12 1/2	3.270	1/4	1 1/8	1 3/8	7 3/8	2.494	7	1 3/4	.760



MORSE TAPER SHANK

Taper No.	Dia. of Small End	Dia. at End of Socket	SHANK Whole Length	SHANK Depth	Depth of Bore	Standard Plug Depth	TONGUE Thickness	TONGUE Length	KEYWAY Width	KEYWAY Length	End of Socket to Keyway	Cutter Radius	Taper per Foot
	D	A	B	S	H	P	t	T	W	L	K	R	
0	.252	.356	2 11/32	2 7/32	2 1/32	2	5/32	1/4	.160	9/16	1 15/16	5/32	.6246
1	.369	.475	2 9/16	2 7/16	2 3/16	2 1/8	13/64	3/8	.213	3/4	2 1/16	3/16	.5986
2	.572	.700	3 1/8	2 15/16	2 5/8	2 9/16	1/4	7/16	.260	7/8	2 1/2	1/4	.5994
3	.778	.938	3 7/8	3 11/16	3 1/4	3 3/16	5/16	9/16	.322	1 3/16	3 1/16	9/32	.6023
4	1.020	1.231	4 7/8	4 5/8	4 1/8	4 1/16	15/32	5/8	.478	1 1/4	3 7/8	5/16	.6233
5	1.475	1.748	6 1/8	5 7/8	5 1/4	5 3/16	5/8	3/4	.635	1 1/2	4 15/16	3/8	.6315
6	2.116	2.494	8 9/16	8 1/4	7 3/8	7 1/4	3/4	1 1/8	.760	1 3/4	7	1/2	.6256

TAN - Taper per Foot divided by 24 and then multiplied by 2